St. Joe River Subbasin Assessment and Total Maximum Daily Loads

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Cover picture by Bijay Adams.

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Abbreviations, Acronyms, and Symbols

303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section
µ	micro, one-one thousandth
µg/L	micrograms per liter
§	Section (usually a section of federal or state rules or statutes)
BURP	Beneficial Use Reconnaissance Program
C	Celsius
CFR	Code of Federal Regulations (refers to citations in the federal administrative rules)
cfs	cubic feet per second
cm	centimeters
CWA	Clean Water Act
CWE	cumulative watershed effects
DEQ	Department of Environmental Quality
E. coli	*Escherichia coli* bacteria
EPA	United States Environmental Protection Agency
GIS	Geographical Information Systems
IDAPA	Refers to citations of Idaho administrative rules
IDL	Idaho Department of Lands
INFISH	The federal Inland Native Fish Strategy
KEA	Kootenai Environmental Alliance
L	liter
LA	load allocation
LC	load capacity
mg	milligram
mi	mile
mi^2	square miles
mg/L	milligrams per liter
mL	milliliter
mm	millimeter
MOS	margin of safety
MWMT	maximum weekly maximum temperature
NB	natural background
NTU	nephlometric turbidity unit
PCR	primary contact recreation
RASI	Riffle Armor Stability Index
RUSLE	Revised Universal Soil Loss Equation

SCR secondary contact recreation

SFI DEQ's stream fish index

SHI DEQ's stream habitat index

SMI DEQ's stream macroinvertebrate index

SS salmonid spawning

TMDL total maximum daily load

U.S. United States

USC United States Code

USFS United States Forest Service

USGS United States Geological Survey

WAG Watershed Advisory Group

WBAGII *Water Body Assessment Guidance,* Version II

WET whole effluence toxicity

WLA waste load allocation

WQLS water quality limited segment

WQS water quality standard

Executive Summary

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 USC § 1251.101). States and tribes, pursuant to Section 303 of the CWA are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list of impaired waters, currently every two years. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards. This document addresses the water bodies in the St. Joe River subbasin that have been placed on what is known as the "303(d) list."

This subbasin assessment and TMDL analysis has been developed to comply with Idaho's TMDL schedule. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the St. Joe River subbasin located in the Idaho Panhandle. The first part of this document, the subbasin assessment, is an important first step in leading to the TMDL. The starting point for this assessment was Idaho's current 303(d) list of water quality limited water bodies. Seventeen segments of the St. Joe River subbasin were listed on this list. The subbasin assessment portion of this document examines the current status of 303(d) listed waters. It also defines the extent of impairment as well as causes of water quality limitation throughout the subbasin. The loading analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

Subbasin at a Glance

Hydrologic Unit Code	17010304
Water Quality Limited Segments	17
Beneficial Uses Affected	Cold water, salmonid spawning, primary and secondary contact recreation
Pollutants of Concern	Sediment, nutrients, bacteria, dissolved oxygen, temperature
Known Land Uses	Forestry, agriculture, recreation

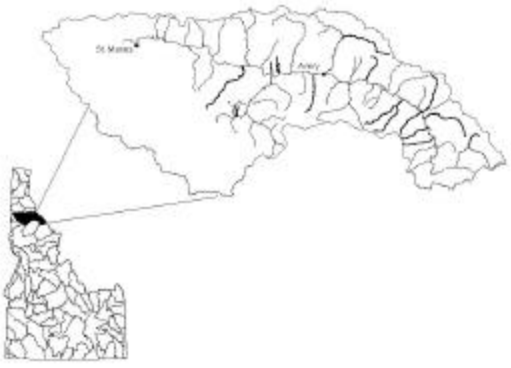

Figure A. St. Joe River Subbasin Location and Listed Segments

Key Findings

The St. Joe River watershed remained in a relatively natural condition until the early twentieth century when miners, loggers, and ranchers began to settle in the area. The watershed has a history of timber harvest and some grazing, which, in recent years, has been restricted to the floodplain of the lower river. Seventeen streams of the subbasin are 303(d) listed for sediment, temperature, habitat alteration, nutrients, bacteria, and dissolved oxygen. Twelve of the seventeen listed segments are listed for temperature, eight segments are listed for sediment, five segments are listed for bacteria, three segments are listed for dissolved oxygen, and one segment each are listed for plant growth nutrients and habitat alteration. The sediment in the subbasin is primarily from road crossing and encroachment. Temperature can be most affected by stream shading. Nutrients and bacteria come mainly from livestock, while dissolved oxygen is affected by discharge of oxygen demanding materials that, in the St. Joe River subbasin, would come from livestock wastes. Impairment of cold water use was assessed using composite scores of fish, macroinvertebrate, and habitat indices. These scores generally indicate full support in most streams assessed in the subbasin, but they also indicate use impairment in some tributaries to the river. Fishhook, Bear, Blackjack, Bond, and Norton Creeks, and tributaries to Marble Creek have index scores below the threshold of full support. The St. Joe River itself was not listed nor was it found to be impaired in this assessment.

An assessment of temperature data indicates that all streams assessed exceed at least one of the temperature standards. Dissolved oxygen and bacteria were not found limiting in Blackjack, Harvey, or Tank Creeks, while bacteria were also not found to be limiting in Bear and Little Bear Creeks. These listings were likely made 15 years ago when grazing was practiced in these watersheds. Habitat alteration is not an effect that can be allocated in a TMDL. Nutrient data from Gold Creek remains to be assessed after control areas are monitored. Sediment yield monitoring indicates that Mica, Bear, and Fishhook Creeks are at sediment yield levels above that expected to cause water quality impairment, as are Hugus, Eagle, Boulder, and Lower Marble Creeks. The low pool volumes in the Marble Creek tributaries may be the result of splash dam log transport and the low index scores may be the result of temperature impairments. These issues require additional assessment. The assessment resulted in temperature TMDLs for all the segments listed for temperature (Table A). Sediment TMDLs were completed for Mica, Fishhook, and Bear Creeks (Table A). Recommendations for the delisting of streams and pollutants is provided in Table B.

Table A. Streams and pollutants for which TMDLs were developed.

Stream	Segment ID Number	Assessment Unit	1998 303(d) Boundaries	Pollutant(s)
Bear/Little Bear Creeks	7606/7607	PN033_02	Headwaters to Toles Creek	Sediment/ Temperature
Beaver Creek	5619	PN025_02/ PN048_02	Headwaters to St. Joe River	Temperature
Blackjack Creek	7577	PN027_02	Headwaters to St. Joe River	Temperature
Bluff Creek	5022	PN045_02	Headwaters to St. Joe River	Temperature
Fishhook Creek	3608	PN039_04	Lick Creek to St. Joe River	Sediment/ Temperature
Fly Creek	2016	PN041_02	Headwaters to St. Joe River	Temperature
Gold Creek	3622	PN053_02	East Fork Gold Creek to St. Joe River	Temperature
Harvey Creek	7576	PN027_02	Lick Creek to St. Joe River	Temperature
Heller Creek	2017	PN041_02	Headwaters to St. Joe River	Temperature
Loop Creek	5620	PN060_02/03	Headwaters to St. Joe River	Temperature
Mica Creek	3601	PN030_03	Headwaters to St. Joe River	Sediment
Mosquito Creek	2020	PN046_02	Headwaters to St. Joe River	Temperature
Simmons Creek	2022	PN052_02/03	Headwaters to St. Joe River	Temperature
Tank Creek	7575	PN027_02	Headwaters to St. Joe River	Temperature

Table B. Summary of assessment outcomes.

Water Body Segment	Pollutant	TMDLs Completed/ Required	Recommended Changes to 303(d) List	Recommended Schedule Changes	Justification[1]
Bear/ Little Bear Creeks	bacteria	0	delist for bacteria	none	bacteria monitoring results
Bear/Little Bear Creeks	sediment	1	none	none	N/A
Bear/ Little Bear Creeks	temperature	1	none	none	N/A
Bird Creek	sediment	0	delist for sediment	none	WBAGII and sediment model results
Blackjack Creek	dissolved oxygen	0	delist for dissolved oxygen	none	dissolved oxygen monitoring results
Blackjack Creek	bacteria	0	delist for bacteria	none	bacteria monitoring results
Blackjack Creek	sediment	0	delist for sediment	none	SHI and sediment model results
Blackjack Creek	temperature	1	none	none	N/A
East Fork Bluff Creek	sediment	0	delist for sediment	none	WBAGII and sediment model results
Fishhook Creek	sediment	1	none	none	N/A
Fishhook Creek	temperature	1	none	none	N/A
Gold Creek	habitat alteration	0	none	none	TMDLs not developed for habitat alteration
Gold Creek	nutrients	0	delist for nutrients	none	nutrient monitoring results
Gold Creek	sediment	0	delist for sediment	none	WBAGII and sediment model results
Gold Creek	temperature	1	none	none	N/A
Harvey Creek	dissolved oxygen	0	delist for dissolved oxygen	none	dissolved oxygen monitoring results
Harvey Creek	bacteria	0	delist for bacteria	none	bacteria monitoring results
Harvey Creek	sediment	0	delist for sediment	none	WBAGII and sediment model results
Harvey Creek	temperature	1	none	none	N/A
Loop Creek	sediment	0	delist for sediment	none	SFI and sediment model results

Table B, continued.

Water Body Segment	Pollutant	TMDLs Completed/ Required	Recommended Changes to 303(d) List	Recommended Schedule Changes	Justification
Loop Creek	unknown	0	delist for unknown	none	no evidence of unknown pollutant found
Mica Creek	sediment	1	none	none	N/A
Tank Creek	dissolved oxygen	0	delist for dissolved oxygen	none	dissolved oxygen monitoring results
Tank Creek	bacteria	0	delist for bacteria	none	bacteria monitoring results
Tank Creek	sediment	0	delist for sediment	none	sediment model results
Tank Creek	temperature	1	none	none	N/A

[1]WBAGII – *Water Body Assessment Guidance*, Version II; SFI – stream fish index; SHI – stream habitat index.